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ABSTRACT

Rapid technological development in the last decade has made it easier than ever to use technologies as collaborative learning tools. Computer video conferencing as a computer-supported collaborative learning (CSCL) technology brings learners closer to real-world environments and it provides increasing opportunities for learners to share experiences across time and space. This paper reports on how multipoint desktop video conferencing (MDVC) is used in preservice teacher education programs in Singapore. Summative research findings reveal that student teachers reacted positively to the scaffolding provided by peers and supervisors via video conferencing. MDVC apparently opened up a new avenue for collegial learning, and student teachers do not have to rely only on the expertise found in their own schools. (Contains 18 references.) (Author)

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Multipoint Desktop Videoconferencing for Teacher Training: A Singapore Experience

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Abstract: Rapid technological development in the last decade makes it easier than ever to use technologies as collaborative learning tools. Computer video conferencing as a computer-supported collaborative learning (CSCL) technology brings learners closer to real-world environments and it provides increasing opportunities for learners to share experiences across time and space. This paper reports on how multipoint desktop video conferencing (MDVC) is used in preservice teacher education programs in Singapore. Our summative research findings reveal that student teachers reacted positively to the scaffolding provided by peers and supervisors via video conferencing. MDVC apparently opened up a new avenue for collegial learning, and student teachers do not have to rely only on the expertise found in their own schools.

Introduction

During the evolution of computer-supported collaborative learning technologies, researchers have increasingly embraced Vygotsky's sociocultural theory (Vygotsky, 1986) in evaluating and understanding electronic learning environments (Bonk & Cunningham, 1998). Vygotsky's sociocultural theory postulates that individual mental functioning is inherently situated in social interactional, cultural, institutional and historical contexts, and learning occurs through social interactions with peers, mentors and experts. Researchers holding sociocultural views have begun to concentrate their investigations on the role of social interactions and dialogues, scaffold instructions and collaboration in computer conferencing environments (Iseke-Barnes, 1996). Focuses are shifting from discussions on tool features and procedures to the theoretical rationale or justification for using technologies, and to studies on how technologies can augment and redefine the academic learning environment (Koschmann, Myers, Feltovich & Barrows, 1994).

Reflective practice is a widely accepted concept in teacher education. It is generally agreed that active and critical examination of one's thoughts and teaching will help one to make sense of the complexities of teaching and improve one's teaching. Reflection as defined by Dewey (1933) is "turning a subject over in the mind and giving it serious and consecutive consideration," and it enables us "to act in a deliberate and intentional fashion". Schon (1983) developed Dewey's concept of reflection by emphasizing the context and time in which reflection takes place. According to him, reflection may be "reflection on action" and "reflection in action". "Refection on action" refers to the thinking about the lesson before as well as after the lesson. "Reflection in action" refers to the thinking that occurs during the act of teaching. The assumption is that by thinking about our actions and reactions as we are teaching we can improve our teaching. Loughran (1997) developed a conceptual framework that may help preservice teachers reframe their experiences. Reflection may take place in three stages, (1) during the

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act of planning the lesson (anticipatory reflection), (2) during the actual teaching of the lesson (contemporaneous reflection) and (3) after the lesson (retrospective reflection).

Reflection is an essential component for bringing understanding to the complex nature of classrooms (Zeichner & Liston, 1996). As suggested by various researchers (Richardson, 1989; Schon, 1983; Zeichner & Liston, 1987), reflection should not take place in isolation, rather teachers should constantly strive to make sense of their practice and the student learning with other teachers. This paper reports on how multipoint desktop video conferencing (MDVC) is used to facilitate reflective practice of student teachers during their teaching practice. Learning theorists claim that when learning is situated in meaningful contexts requiring collaborative processing, learners tend to remember the information better (Brown, 1989; Cognition and Technology Group at Vanderbilt, 1991). We hope to find unique opportunities in MDVC for student teachers to share ideas, experiences and teaching resources in real time with an audience wider than the schools where they teach.

Launching of the Teaching Practice Discourse and Computer Communications Technology Project

The Teaching Practice Discourse and Computer Communications Technology Project of National Institute of Education, Singapore, is a project funded by the Ministry of Education of Singapore, and it was launched in May 1999. The project builds on a previous research effort that investigates the discourses between student teachers and their university supervisors (Sharpe, et al., 1994). The early research found that there was a preponderance of low-level factual discourse in student teacher-supervisor conferences, and that conferences were relatively short. It concluded that ways and means needed to be found to increase both the quantity and quality of student teachers and supervisor discourse.

The appearance of multipoint desktop video conferencing (MDVC) technology brings hope that this new communication technology may help to break down barriers of time and space that prevent the quantity and quality of professional sharing. Desktop video conferencing allows users at different locations to see and hear each other using ordinary desktop computers fitted with cameras, microphones, speakers and necessary hardware and software. Desktop video conferencing may be point-to-point, meaning persons talking to each other from two separate desktop computers, and it may be multi-point, that is several persons conference from several desktop computers. For the purpose of our project, we needed a system that could link student teachers across schools and the choice had to be multi-point.

Fortunately, by the time our project was initiated, all the Singapore schools had been provided with Asynchronous Digital Subscriber Line (ADSL) gateway access into SingaporeONE, an ATM network suitable for Wideband Internet applications. SingaporeONE offers low cost user access into a system already designed to distribute video-on-demand (VOD) multimedia services and with sufficient bandwidth capable of hosting a multi-channel MDVC server. The project takes advantage of the existing infrastructure in the schools and uses CU-SeeMe for video conferencing.

The First Phase of the Project (May 1999 – May 2000)

During the first phase of the project, we concentrated on exploring the feasibility of using MDVC for student teachers to have real time discussion. Student teachers doing teaching practice in different schools used MDVC to conference with their peers in other schools and their university supervisors (Sharp, et. al., 2000). Conferences were carried out on a weekly basis among student teachers and their university supervisors. Each conference group consisted of up to five student teachers from different schools and one supervisor. The participants shared ideas and experiences on aspects of their teaching with their peers and their university supervisors in real time.

Three cohorts of 59 student teachers used MDVC during the first phase. Summative evaluations showed that MDVC benefited the users in a number of ways. First, it provided an avenue for student teachers to share ideas, problems and solutions. It enabled them to discuss any matters relating to their teaching practice at the time needed and to receive immediate feedback from peers and supervisors. This is particularly important when student teachers experience varying degrees of isolation from their university supervisors and peers. MDVC also provided a channel for student teachers to obtain peer support and encouragement so that there was a reduction in stress for some of them. More importantly,

MDVC broke down communication barriers between student teachers and supervisors. As a result, they felt more comfortable to share ideas and discuss problems with their supervisors.

Student teachers reacted positively to scaffolding provided by peers and supervisors via MDVC. It appears that MDVC opens up a new avenue for collegial learning, and student teachers do not have to rely only on the expertise found in their own schools. Peer and mentor support helps to reduce student teachers' frustration and isolation. It stimulates more interchanges among peer learners and between learners and supervisors. There was a definite feeling amongst all the participating student teachers that they knew each other and the university supervisor much better than they would otherwise. As a student teacher put it, "I look forward to MDVC sessions because I know I will get encouragement and support from fellow trainees and the lecturer chairing the session". It appeared that MDVC actually enhanced trust, perhaps, by a process of decontextualizing conferencing by providing an alternative social frame (Goffman, 1974).

The Second Phase of the Project (July 2000 - present)

During the second phase of the project, we explored the possibilities of using video streaming in MDVC. During the seven-week teaching practice (3 July to 25 August 2000), 28 student teachers were each allocated one of the three teaching competencies for video taping: (1) lesson introduction, (2) questioning and explaining, and (3) small group teaching. A checklist covering a number of teaching behaviors associated with each competency was provided to help student teachers in planning and was explained in detail by one of the researchers. Of the four weeks MDVC, three were used to cover each of the three competencies and one was used for overall reflection.

All the schools involved were provided with a digital video camera, tripod and digital video capture card. Six of these cameras were able to record digital video to tape whilst simultaneously capturing digital still photographs to a memory card, while the other two captured directly to a memory card in MPEG1 format. Both allowed uploading of digital video to a PC and subsequent transfer to the university by the File Transfer Protocol (FTP) method in either MPEG1 or AVI digital video format. Both the school technical assistants and student teachers were trained in how to use the cameras and tripods, the capture cards and FTP. They were also shown where to position the camera in the classroom.

Each student teacher arranged with a fellow trainee or their school's technical assistant to make one three-minute digital video clip of their classroom teaching using the digital video camera. They were allowed to re-shoot the video if they were unhappy with it. The video clips were then transferred electronically by the school technical assistants to the university using the File Transfer Protocol (FTP). At the university, the video clips were edited and placed in a password-protected area of the project WebPage. Video streaming was chosen over conventional file downloading mainly for the reason of confidentiality. Using video streaming meant that no permanent file would be left on the school computers and no video streams may be copied. The school technical assistants were instructed to delete the clips from their own hard disks once they had been transferred to the university.

The student teachers were instructed to view the video clips prior to the scheduled MDVC conference the following day. At one of the conferences, however, the supervisor chairing the session found that four out of five student teachers had not watched the clips for various reasons. The student teachers were then instructed to leave the conference and to return in 20 minutes after viewing the video clips. This unexpected situation turned out to be helpful for us in understanding the feasibility for such a use of technology. All the student teachers reported easy downloading and convenience of viewing the video clips. It took only around one minute to download one three-minute video clip. They responded extremely positively towards such a new experience and welcomed the opportunities provided in sharing of their peers' teaching using the learning environment of MDVC and the Web.

As we were able to stream videos successfully both before and during the MDVC sessions, most student teachers watched video clips of participants in their own group, and some managed to watch clips from other groups (Figure 1). In addition, we tried to incorporate in the Whiteboard in the MDVC sessions. The student teachers were asked to take at least one still video photograph per week of aspects of their school, including their pupils' work and one of the MDVC conferences was devoted to the sharing of these photographs, using the application sharing feature of the CU-SeeMe.

Figure 1 Viewing video clips during an MDVC session

Despite the technical problems encountered initially, the feedback collected so far was generally positive. The student teachers appreciated the opportunities of sharing ideas with their peers. Typical comments were "Eager to hear from what other trainees have to comment on my teaching". "Informative, reflective, corrective". "Received positive comments that build up my confidence". "Peers normally give very non-threatening and constructive feedback. It's very comforting". However, a few student teachers felt that there was not enough critical comments, for example: "full of praise, good but doesn't help me improve on my bad points as some comments are withheld". All indicated that it was a good learning experience and most would probably agree with the student who commented that it was a "good learning experience; helps in better and more critical analysis development".

Viewing their own teaching clips obviously facilitated the student teachers to reflect. As one student teacher put it, "it was definitely beneficial as I was able to evaluate and reflect on how I could improve myself". Another one said it was "helpful in pinpointing my own mistakes". Still another one could actually see how I teach and learn the mistakes that I made".

From February 2001, we entered the final stage of Phase Two. While continuing to video stream in videoconferences, we incorporated the facility of file sharing of CU-SeeMe (Whiteboard) in our conferences. We shared lesson plans and web pages during the conferences. We intend to conduct in-depth analysis at the completion of this cohort's teaching practice. Such analysis will help us learn as much as possible about its pedagogic value and the kinds of administrative support required (Winn & Jackson, 1999).

Discussion

Our experience has demonstrated that it is technically feasible to use multipoint desktop video conferencing to facilitate student teachers' reflective practice and it is possible to combine multipoint desktop video conferencing with digital video streaming. Although we have not experienced one hundred percent reliability, we can predict that such reliability is not too far away.

MDVC helped create a platform for the kind of 'reflective practicum' propounded by Schon (1987) and later refined by Darling-Hammond (1994). The student teachers were provided with opportunities to "learn by teaching, learn by doing and learn through collaboration" (Darling-Hammond, 1994). The MDVC enabled our student teachers to take part in a 'distributive community of practice' with participants who shared a common concern of learning how to teach. By participating in videoconferences, student teachers were provided with opportunities to participate in reflective conversations with their university supervisors and peers.

Our summative evaluations to date show that MDVC benefits the users in a number of ways. In our student teachers' opinion, a major advantage of MDVC over face-to-face conferences is that MDVC reduces the "physical barriers" and it makes it easier "to bring up issues because you feel a safety in distance". It appears that MDVC represents a less formal medium compared to the formally arranged face-to-face supervisor visits. MDVC provides an avenue for student teachers to share ideas, problems and solutions. It enables them to discuss any matters relating to their teaching practice at the time needed and to receive immediate feedback from peers and supervisors. This is particularly important when

student teachers experience varying degrees of isolation from their university supervisors and peers. MDVC also provides a channel for them to obtain peer support and encouragement so that there is a reduction in stress for some of them. As a result, they feel more comfortable to share ideas and discuss problems with their supervisors. Timely feedback, questions, and reconceptulizations from both supervisors and peers further fueled these learning activities because of the relevance of the discussions to teaching.

But did the platform and the opportunities that it provided actually result in improvements in discourse and reflectivity? At this stage, we only have feedback from the student participants and our own experiences to go by, although we intend to collect a range of 'harder' evidence during the main study which began in late February 2001. It is clear from the feedback that the student teachers felt that watching themselves and their peers teach and being able to discuss this had been beneficial. As chairpersons, we thought we detected a growing confidence and willingness to join in discussions as the weeks went by. All participants joined in the discussions and there was never a shortage of anecdotes and ideas to share. We felt that the shyness and unwillingness to criticize that some of the participants noted was more a feature of the earlier conferences. In our judgement, it was due in part to the student teachers never before having had to engage in professional discussion of each other's teaching. As a result they lacked the requisite critical and justificatory discourse skills. The video clips and conferences provided them with practice in this important professional skill but, we feel, that we still have a great deal to learn in this respect.

References:

Bonk, C.J., & Cunningham, D.J, (1998). Searching for learner-Centered, constructivist, and sociocultural components of collaborative learning tools. In C.J. Bonk & K.S. King (Eds.), *Electronic Collaborators: Technologies for literacy, apprenticeship and discourse* (pp. 25-50). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Brown, J.S., Collins, A., & Duguid, P. (1989). Situated learning and the culture of learning. *Educational Researcher, 18*(1), 32-41.

Cognition and Technology Group at Vanderbilt. (1991). Technology and the design of generative learning environments. *Educational Technology, 31*(5), 34-40.

Darling-Hammond, L. (1994). Constructivism and multimedia: Theory and application; innovation and transformation. *International Journal of Instructional Media, 23*(2), 161-165.

Dewey, J. (1933). How we think a restatement of the relation of reflective thinking to the educative process. New York: Heath and Company.

Goffman, E. (1974). *Frame analysis: an essay on the organization of experience.* Cambridge, Massachusetts: Harvard University Press.

Iseke-Barnes, J.M. (1996). Issues of educational use of the Internet: Power and criticism in communications and searching. *Journal of Educational Computing Research, 8*(3), 291-309.

Koschmann, T.D., Myers, A.C., Feltovich, P.J. & Barrows, H.S. (1994). Using technology to assist in realizing effective learning and instruction: a principled approach to he use of computer in collaborative learning. *Journal of the Learning Science, 3*(3), 219-225.

Loughran, J.J.(1997). Teaching about teaching: principles and practice. In J. Loughran & T. Russell (Eds.), *Teaching about teaching: purpose, passion and pedagogy in teacher education.* Washington DC: The Falmer Press.

Richardson, V. (1989). The evolution of reflective teaching and teacher education. In R. Clift, W.R.Houston, & M.Pugach, Encouraging reflective practice: an examination of issues and examples. New York: Teachers College Press.

Schon, D.A. (1987). *Educating the reflective practitioner: Toward a new design for teaching and learning in the professions*. San Francisco: Jossey-Bass.

Sharpe, L., Moo. S.N., Crawford, L., & Gopinathan, S. (1994). *Teacher supervision patterns of discourse*. (Singapore: National Institute of Education).

Sharpe, L., Hu, C., Crawford, L., Gopinathan, S., Moo, S.N., & Wong, A. (2000). Multipoint desktop videoconferencing as a collaborative learning tool for teacher preparation: A Singapore experience. *Educational Technology, 40*(5), 61-63.

Schon, D. A. (1983). The reflective practitioner: how professional think in action. New York: Basic Books.

Winn, W., & Jackson, R. (1999). Fourteen propositions about educational uses of virtual reality. *Educational Technology, 39*(4), 5-13.

Zeichner, K.M. & Liston, D.P. (1987). Teaching student teachers to reflect. Harvard Educational Review, 57(1), pp. 23-87.

Zeichner, K.M., & Liston, D.P. (1996). *Reflective teaching: An introduction*. NJ: Lawrence Erlbaum & Associates.

Vygotsky, L. (1986). *Thought and language* (Rev. ed.). Cambridge, Massachusetts: MIT Press.

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